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(54) DRIVING METHOD FOR LIQUID CRYSTAL DISPLAY DEVICE

(57)Abstract:

PROBLEM TO BE SOLVED: To prevent a liquid crystal panel from flickering even when driven at low frequency by a MLA method by making rows of row elements of an orthogonal matrix which are inverted and rows which are not inverted

correspond to adjacent row electrodes.

SOLUTION: This is a driving method of driving a simple matrix liquid crystal display element by a multi-line

simultaneous selecting method using an orthogonal matrix and the matrix of (n) rows by (m) columns is denoted as A. The row elements of n/2 (n: even number)

rows of row elements of the orthogonal matrix A are inverted in polarity to obtain an orthogonal matrix A1 and the row elements of other (n)/2 rows are inverted in polarity to obtain an orthogonal matrix A2. After A1

$$\begin{array}{ccc}
 \text{[A]} & & \text{[A1]} \quad \text{[A2]} \\
 \text{(A, 行列)} & & \text{(A, 行列)} \quad \text{(A, 行列)} \\
 \begin{array}{cccc}
 -1 & 1 & 1 & 1 \\
 1 & 1 & -1 & 1 \\
 1 & -1 & 1 & 1 \\
 1 & 1 & 1 & -1
 \end{array} & \Rightarrow & \begin{array}{cccc}
 -1 & 1 & 1 & 1 \\
 -1 & -1 & 1 & -1 \\
 1 & -1 & 1 & 1 \\
 -1 & 1 & -1 & 1
 \end{array} + \begin{array}{cccc}
 1 & -1 & -1 & -1 \\
 1 & 1 & -1 & 1 \\
 -1 & 1 & -1 & -1 \\
 1 & 1 & 1 & -1
 \end{array} \\
 \text{奇数フレーム} & & \text{偶数フレーム}
 \end{array}$$

is used as an orthogonal matrix to simultaneously selectively drive multiple lines, the orthogonal matrix A2 is used to simultaneously selectively drive multi lines, the inverted rows and uninverted rows of row elements of the orthogonal matrixes A1 and A2 are made to correspond to adjacent row electrodes. Consequently, luminance displacement is canceled between adjacent row electrodes to prevent flickering even when the driving frequency is lowered.

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(54) 【発明の名称】 液晶表示装置の駆動方法

(57) 【要約】 (修正有)

【課題】 MLA法で液晶表示装置を低周波駆動して液晶パネルのちらつきを防止し、低消費電力化を達成する。

【解決手段】 MLA駆動において、直交行列「A」の第1行と第3行の行列要素の極性を反転させた直交行列「A₁」と、直交行列「A」の第2行と第4行の行列要素の極性を反転させた直交行列「A₂」とを使用して複数ライン同時選択駆動を行う。

$$\begin{array}{c}
 \text{「A」} \\
 \begin{array}{cccc}
 -1 & 1 & 1 & 1 \\
 1 & 1 & -1 & 1 \\
 1 & -1 & 1 & 1 \\
 1 & 1 & 1 & -1
 \end{array}
 \end{array}
 \Rightarrow
 \begin{array}{c}
 \text{「A}_1\text{」} \\
 \text{(2, 4行反転)} \\
 \begin{array}{cccc}
 -1 & 1 & 1 & 1 \\
 -1 & -1 & -1 & -1 \\
 1 & -1 & 1 & 1 \\
 -1 & -1 & -1 & 1
 \end{array}
 \end{array}
 +
 \begin{array}{c}
 \text{「A}_2\text{」} \\
 \text{(1, 3行反転)} \\
 \begin{array}{cccc}
 1 & -1 & -1 & -1 \\
 1 & 1 & -1 & 1 \\
 -1 & 1 & -1 & -1 \\
 1 & 1 & 1 & -1
 \end{array}
 \end{array}$$

奇数フレーム 偶数フレーム